Listing of Claims

This listing of claims replaces all prior versions of claims in the application.

1. (Currently Amended) A method of fabricating a semiconductor memory device comprising the steps of:

forming a charge storage film for storing electric charge; and

erasing electric charge stored in said charge storage film by subjecting said charge storage film to hydrogen plasma treatment after the formation thereof,

wherein said charge storage film is any one of:

a silicon nitride film,

a double-layered film comprising a silicon oxide film and a silicon nitride film, and

a three-layered film comprising a silicon oxide film, a silicon nitride film and a silicon oxide film.

2. (Original) The method of fabricating a semiconductor memory device according to Claim 1, wherein said plasma treatment is carried out over a duration of time of 40 seconds to 90 seconds.

3. (Original) The method of fabricating a semiconductor memory device according to Claim 1, further comprising, after the formation of said charge storage film, a step of forming a contact hole through which a wiring connection is to be established, and then subjecting said film to said hydrogen plasma treatment through said contact hole.

4. (Original) The method of fabricating a semiconductor memory device according to Claim 3, wherein said plasma treatment is carried out before, during, or after a barrier metal is formed along the inner wall of said contact hole.

5. (Original) The method of fabricating a semiconductor memory device according to Claim 4, wherein said barrier metal has a thickness of 5 nm or less.

6. (Original) The method of fabricating a semiconductor memory device according to Claim 1, wherein said plasma treatment is carried out at 350 °C to 450 °C.

7. (Canceled)

8. (Original) The method of fabricating a semiconductor memory device according to Claim 2, further comprising, after the formation of said charge storage film, a step of forming a contact hole through which a wiring connection is to be established and then subjecting said film to said hydrogen plasma treatment through said contact hole.

9. (Original) The method of fabricating a semiconductor memory device according to Claim 8, wherein said plasma treatment is carried out before, during, or after a barrier metal is formed along the inner wall of said contact hole.

10. (Original) The method of fabricating a semiconductor memory device according to Claim 9, wherein said barrier metal has a thickness of 5 nm or less.

11. (Original) The method of fabricating a semiconductor memory device according to Claim 2, wherein said plasma treatment is carried out at 350 °C to 450 °C.

12. (Canceled)

13. (Currently Amended) A method of fabricating a semiconductor memory device comprising the steps of:

forming a charge storage film for storing electric charge; and

erasing electric charge stored in said charge storage film by subjecting said charge storage film to hydrogen annealing after the formation thereof,

wherein said charge storage film is any one of:

a silicon nitride film,

a double-layered film comprising a silicon oxide film and a silicon nitride film, and

a three-layered film comprising a silicon oxide film, a silicon nitride film and a silicon oxide film.

14. (Original) The method of fabricating a semiconductor memory device according to Claim 13, wherein said annealing is carried out over a duration of time of 30 minutes to 90 minutes.

15. (Original) The method of fabricating a semiconductor memory device according to Claim 13, further comprising, after the formation of said charge storage film, a step of forming a contact hole through which a wiring connection is to be established, and then subjecting said film to said hydrogen annealing through said contact hole.

16. (Original) The method of fabricating a semiconductor memory device according to Claim 13, wherein said annealing is carried out at 400 °C or above.

17. (Canceled)

18. (Original) The method of fabricating a semiconductor memory device according to Claim 14, further comprising, after the formation of said charge storage film, a step of forming a contact hole through which a wiring connection is to be established and then subjecting said film to said hydrogen annealing through said contact hole.

19. (Original) The method of fabricating a semiconductor memory device according to Claim 14, wherein said annealing is carried out at 400 °C or above.

20. (Canceled)

21. (Withdrawn) A semiconductor memory device having a charge storage film for storing electric charge, said semiconductor memory device comprising:

first contact hole used for wiring connection, and;

second contact hole not used for wiring connection but used for facilitating diffusion of hydrogen radicals or hydrogen molecules into said charge storage film.

22. (Withdrawn) The semiconductor memory device according to Claim 21, wherein said charge storage film is any one of a nitride film, a double-layered film comprising an oxide film and a nitride film, and a three-layered film comprising an oxide film, a nitride film and an oxide film.